

CLAIMS

1 1. A method for a file server to allocate a spare disk to replace a failed disk in a net-
2 work storage system comprising the steps of:

3 identifying a set of spare disks;
4 choosing a best spare disk of the set of spare disks; and
5 claiming ownership of the best spare disk.

1 2. The method of claim 1 further comprising the steps of:

2 choosing, in response to a failure of the step of claiming ownership, a next best
3 spare disk of the spare disks available; and
4 claiming ownership of the next best spare disk.

1 3. The method of claim 2, wherein the step of claiming ownership of the best spare
2 disk further comprises the steps of:

3 setting a first ownership attribute to a file server-owned state; and
4 setting a second ownership attribute to a file server-owned state

1 4. The method of claim 1 wherein the step of choosing the best spare disk further
2 comprises the steps of:

3 selecting one or more disks from the set of spare disks that satisfy one or more
4 rules;

5 sorting the one or more disks selected from the set of spare disks according to a
6 set of ordered policies to identify a highest-ranked disk;

7 choosing a highest-ranked disk as the best spare disk; and

8 choosing, in response to more than one of the one or more disks being highest-
9 ranked, one disk at random, from the more than one of the one or more disks that are
10 highest-ranked, as the best spare disk.

1 5. A method of verifying that a plurality of disks in a volume are optimally config-
2 ured comprising the steps of:

3 identifying all of the disks in the volume;
4 obtaining disk characteristics, respectfully, from all of the disks in the volume;
5 comparing the disk characteristics with a set of policies and characteristics of
6 spare disks; and

7 alerting an administrator if a more optimal configuration is possible.

1 6. The method of claim 5 further comprising the step of:

2 reconfiguring the disks into a more optimal configuration.

1 7. A method of selecting a best spare disk for use by a file server serving an array of
2 disks from a set of spare disks comprising the steps of:

3 selecting one or more disks from the set of spare disks that satisfy one or more
4 rules;

5 sorting the one or more disks using a set of ordered policies;

6 if only one disk is highest-ranked, selecting the one disk that is highest-ranked as
7 the best spare disk; and

8 if a plurality of disks are highest-ranked, selecting one disks from the plurality of
9 disks that are highest ranks as the best spare disk.

1 8. A network storage system comprising:

2 one or more switches;

3 a plurality of spare disks operatively interconnected through at least one of the
4 switches; and

5 one or more file servers operatively interconnected to at least one of the switches,
6 each of the file servers including means for allocating one of the plurality of spare disks.

1 9. The network storage system of claim 8, wherein the means for allocating one or
2 more of the plurality of spare disks further comprises:

3 means for identifying the plurality of spare disks;
4 means for selecting a best spare disk from the plurality of spare disks; and
5 means for claiming ownership of the best spare disk.

1 10. The network storage system of claim 9, wherein the means for selecting a best spare
2 disk from the plurality of spare disks further comprises:

3 means for selecting a set of disks from the plurality of spare disks that satisfy one or
4 more rules;
5 means for sorting the set of disks according to a set of ordered policies; and
6 means for selecting a highest-ranked disk from the set of disks.

1 11. A computer-readable medium, including program instructions executing on a file
2 server, for allocating a replacement disk to the file server, the program instructions per-
3 forming the steps of:

4 identifying a set of spare disks;
5 choosing a best spare disk of the set of spare disks; and
6 claiming ownership of the best spare disk.

1 12. The computer-readable medium of claim 11, wherein the step of choosing the best
2 spare disk further comprises the steps of:

3 selecting one or more disks from a set of spare disks that satisfy one or more
4 rules;
5 sorting the one or more disks selected from the set of spare disks according to a
6 set of ordered policies to identify a highest-ranked disk;
7 choosing a highest-ranked disk as the best spare disk; and
8 choosing, in response to more than one of the one or more disks being highest-
9 ranked, one disk at random, from the more than one of the one or more disks that are
10 highest-ranked, as the best spare disk.